assumes that the glass of the bottle and wine are thermally at equilibrium. It does not function accurately in dynamic conditions when one would expect poor response times and inaccurate readings acutely following the application of a thermal gradient to the bottle, i.e., when the bottle is place in a new thermal environment. As an externally applied indirect sensor, it is inherently inaccurate and does not take into account thermal gradients between the bottle external surface and the wine.

Claims 1 and 34 of the present invention have been amended to recite that the means for sensing data indicative of wine quality include at least one sensor operatively located within a sealed wine container, wherein the at least one sensor directly contacts wine or wine vapor within the sealed wine container. These claims are directed to a sensor system that accurately determines numerous properties of the wine in the bottle and directly measures the temperature of the wine, not the glass at any given time..

The examiner argues that Paron et al. teaches that temperature has an effect on taste and therefore quality. This is an inaccurate statement. If wine is exposed to extreme temperatures over time the quality of the wine can be affected. At any given time the temperature of the wine does not reflect its taste or quality at that given time. (Extreme temperatures do not make the wine go bad immediately but predispose the wine to spoiling over time) Therefore an externally applied temperature sensor tells nothing about the quality of the wine inside the bottle or its taste at any given moment. Nor can many additional elements be measured accurately without directly contacting the wine itself. One must measure physical and chemical properties such as scattering, acidity, presence of malodorous chemicals, nitrate concentration, etc., to accurately

determine the quality and taste of wine sealed in a bottle- variables not possible with an external bottle temperature indicator.

The present invention does describe and claim such a device. It is a direct quality sensor capable of measuring multiple properties of the wine that do reflect the quality at that moment. The invention specifically addresses the limitation of Paron et al. by incorporating sensor conduits directly into the seal, the bottle, or the interface between the two, to allow the sensor to contact the wine or its vapor to make accurate measurements.

Claims 2-5, 8, 10, 11 and 13-15 depend from claim 1. Claims 36-38 depend from claim 34.

Therefore the rejection should be withdrawn.

Claims 1, 2, 6-10, 12-14, 24, 33-37 and 41 are rejected as being anticipated by Juergens et al. The rejection is respectfully traversed.

Juergens measures wine samples out of the bottle but provides no means for determining the quality of wine in a sealed wine container. Wine makers use numerous techniques for measuring properties of the wine prior to bottling, or for testing wine from an opened bottle if it has spoiled. None offer a technique to evaluate physical and chemical parameters of the wine in the sealed wine container, without violating the seal of the container.

Juergens is directed to chemically analyzing "a wine sample" obtained from wine bottles that have been opened. The claims and patent do not provide a technique for determining the quality of wine in a sealed container.

As discussed above, claims 1 and 34 have been amended to recite limitations for directly analyzing wine in a sealed bottle. Claims 2, 6-10, 12-14, 24 and 33 depend from claim 1. Claims 35-37 and 41 depend from claims 34. Therefore the rejection should be withdrawn.

Claims 1, 2, 16, 17, 23, 24, 29, 30, 39 and 40 are rejected as being anticipated by Wyatt. The rejection is respectfully traversed.

Wyatt measures optical properties of beverages by analyzing specific aliquot samples with a specific detector. This techniques cannot be used on wine contained in a sealed vessel. This technique requires a specific setup using samples of wine placed in a cuvette.

As discussed above, claims 1 and 34 have been amended to recite limitations for directly analyzing wine in a sealed bottle. Claims 2, 16, 17, 23, 24, 29 and 30, depend from claim 1. Claims 39 and 40 depend from claims 34. Therefore the rejection should be withdrawn.

The 35 U.S.C. § 103 Rejections

Claims 17-23, 25-3 (sic) and 40 are rejected as being unpatentable over Wyatt ('092) in view of Prahl et al. The rejection is respectfully traversed.

Prahl et al. describes a device for use with highly scattering tissues or fluids. Wine is a poorly scattering fluid for which the back reflectance is minimal and most likely insufficient for measuring properties by the technique of Prahl et al. Prahl's device is designed for use in the human body on tumors that are highly scattering.

Prahl et al. uses back reflectance to determine the properties of the wine. Due to the poor scattering of wine, back reflectance alone will not be enough to allow for accurate measurements. The present invention claims fiber based sensors to determine spectroscopic properties in the sealed bottle. Optical devices used to determine properties of tissues do not anticipate placement of optical devices in a sealed wine container to determine wine properties. Therefore the rejection should be withdrawn.

Further, claims 17-23 and 25-30 depend from claim 1, which should be allowable as discussed above. Claim 40 depends from claim 34, which should be allowable as discussed above. Therefore the rejection should be withdrawn.

Claims 42-47 are rejected as being unpatentable over Juergens ('909) in view of Ribichon et al. The rejection is respectfully traversed.

Robichon- neither anticipates placing the sensor in the cork for direct measurement of these properties. Claims 24 and 45 have been amended to recite that the means for sensing data indicative of cork quality comprises at least one sensor for directly monitoring at least one chemical factor within a cork indicative of cork spoilage. Claims 43 and46 have been canceled. Claim 44 depends from claim 42. Claim 47 depends from claim 45. Therefore the rejection should be withdrawn.

Conclusions

It is submitted that this application is in condition for allowance based on claims 1-42, 44, 45 and 47 in view of the amendments thereto and the foregoing comments.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version With Markings To Show Changes Made."

If any impediments remain to prompt allowance of the case, please contact the undersigned at 925-292-8652.

Respectfully submitted,

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Attorney for Applicant
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Dated: December 31, 2002

Version With Markings To Show Changes Made

IN THE CLAIMS:

Claims 43 and 46 have been canceled.

Claims 1, 5, 33-35, 42, 44, 45 and 47 have been amended as follows:

1. (Amended) A wine quality sensor, comprising:

means for sensing data indicative of wine quality, wherein said means for sensing data include at least one sensor operatively located within a sealed wine container, wherein said at least one sensor directly contacts wine or wine vapor within said sealed wine container; and

means for measuring and quantifying said data.

5. (Amended) The wine quality sensor of claim 3, wherein said wine bottle is formed of glass, wherein said bottle may be sealed with a seal after it is filled with wine, wherein said sensor package is integrated [into said seal] with a sensor integration configuration selected from the group consisting of (i) integration of said sensor package within said glass, (ii) integration of said sensor package within said seal and (iii) integration of said sensor package between said seal and said glass.

33. (Amended) The wine quality sensor of claim 1, wherein said data is selected from the group consisting of galacturonic acid, gums [- polysaccharides

of arabinose and galactose]; tartaric acid, malic acid, citric acid, succinic acid, lactic acid, acetic acid, potassium bitartrate, formic , Yair Margalit, Pacid, oxalic acid, pyruvic acid, butyric acid, iso-butyric acid, hexanoic acid, octanoic acid, a-Ketoglutaric acid, ethanol, methanol, methyl ester, n-propanol, isopropanol, n-butanol, isobutanol, n-amyl alcohol, 3-methylbutanol, 2-methylbutanol, n-hexanol, 2-phenylethanol, polyalcohols (polyols), 2,3-butandiol, glycerol, eythritol, xylitol, arabitol (also called arabinitol), mannitol, acetaldehyde, acetoin and diacetyl, acetate, butyrate, oxanoate and other esters, ethyl acetate, ethyl formate, propyl acetate, isopropyl acetate, isobutyl acetate, isoamyl acetate, phenylethyl acetate, ethyl propionate, ethyl valerate, ethyl hexanoate (caproate), ethyl octanoate (caprylate), ethyl decanoate (caprate), ethyl lactate, ethyl succinate (acidic ester), methyl o-anthranilate, amino acids, diammonium phosphate, proteins, nitrates, amino acid esters, vitamins, biotin, choline, gallic acid, coutaric acid, caftaric acid, fertaric acid, catechin, epicatechin, gallocatechin gallate, procyanidin [(B1, B2, B3)], catechin catechin gallate, hydroxycinnamic acid esters [(coutaric, caftaric, fertaric)], acids, glutathionyl caftaric acid, catechin+epicatechin, catechin-gallate, afzelechin, catechin, epicatechin, and gallocatechin, flavane (3,4) diol, flavonol-3, cyanindin, delphinidin, peonidin, petunidin, mallvidin, anthocyanins, glycosic, catechin, epicatechin, potassium, sodium, calcium, iron, lithium, magnesium, copper, lead, manganese, aluminum, zinc, rubidium, arsenic, nickel, anions, phosphate, sulfate, borates, silicates, halogens, fatty acids, boron, florine, silicon, phosphate, sulfate, chlorine,

bromine, iodine, anions, sulfur dioxide, acetaldehyde-bisulfite (bound SO2), fumaric acid, vinylbenzene, benzaldehyde, γ-nonalactone, ethyl phenylacetate, p-hydroxybenzoic acid, p-pyrocatechuic acid, gallic acid, vanillic acid,syringic acid, salicyclic acid, o-pyrocatechuic acid, gentisic acid, cinnamic acid, cinnamic acid, p-coumaric acid, caffeic acid, ferulic acid, sinaptic acid, coutaric acid, caftaric acid, fertaric acid, digallic acid, ellagic acid, flavonoids, afzelechin, catechin, gallocatechin, glycosides, tannins, flavylium ion, anthocyanins, pelargonidin, cyanidin, delphinidin, peonidin, petunidin, mallvidin, ethyl acetate, ethyl caproate, terpenoids, glycosides, pyrazines, phenolics, chlorogenic acid, methyl anthranilate, ethyl anthranilate, methyl salicylate, ethyl salicylate, 2-methoxymethyl benzoate, 2 methoxyethyl benzoate, ethyl trans-2 -butenoate, ethyl trans-2-hexenoate, ethyl trans-2-octenoate, ethyl trans-2-decenoate, ethyl trans, trans-2,4 decadienoate, ethyl trans, cis-2,4 decadienoate, ethyl trans, trans, cis-2,4,7-decatrienoate, ethyl trans, cis-2,6-dodecadienoate, methyl 3-hydroxybutanoate, dehyl 3-hydroxybutanoate, ethyl 3-hydroxyhexanoate, damascenone, furaneol, methoxyfuraneol, ethyl 3-mercaptopropanoate, trans-2-hexen-1-ol, hydrogen disulfide, carbon disulfide, dimethyl disulfide, dimethyl sulfide, diethyl sulfide, diethyl disulfide, methanethiol, ethanethiol, dimethyl sulfoxide, methyl thiolacetate, ethyl thiolacetate, cis and trans-2-methylthiophan-3-ol, 5-[hydroxyethyl]-4-methylthiazole, thio aliphatic alcohols, methanionol, or 3-(methylthio)-propanol, polyphenoloxidases, laccase, chlorogenic acid, protocatechuic acid, glutathione,, 2-S-glutathionylcaftaric acid, acetaldehyde,

13C-Norisoprenoids,1,1,6-trimethyl-1,2-dihydronaphthalene (TDN), vitispirane, ellagic acid, lignins, gallic acid, aromatic aldehydes, vanillin, syringaldehyde, coniferyaldehyde, sinapaldehyde, γlactones, cis-β-methyl-γ-lactone, trans-β-methyl-γ-lactone, maltol, cyclotene, ethoxylactone, furfural, furfuryl alcohol, Guaiacol, geosmin, anthocyanine-bisulfite, malvidin glucoside,quinones, tartaric acid, potassium bitartrate, calcium tartrate, furmaric acid, calcium carbonate, sorbic acid, ethyl sorbate, benzoic acid and sodium benzoate, diethyl dicarbonate (DEDC), dimethyl dicarbonate (DMDC), iron, copper, aluminum, hydrogen sulfide, mercaptan, diethyl sulfide, ethyl mercaptan, (1)pH, diacetyl, acetoin, 2,3-butandiol, 2-ethoxyhexa-3.5-diene, histamine, tyramine, putrescine, cadaverine, ethyl carbamate, urea and carbamyl phosphate.

34. (Amended) A method for measuring wine quality, comprising:

sensing data indicative of wine quality, wherein the step of sensing data is carried out with means for sensing data , wherein said means for sensing data include at least one sensor operatively located within a sealed wine container, wherein said at least one sensor directly contacts wine or wine vapor within said sealed wine container; and

measuring and quantifying said data.

35. (Amended) The method of claim 34, wherein the step of sensing data includes sensing data selected from the group consisting of an optical transmission spectrum, an optical fluorescence spectrum, an optical scattering coefficient, galacturonic acid, gums [– polysaccharides of arabinose and galactose]; tartaric acid, malic acid, citric acid, succinic acid, lactic acid, acetic acid, potassium bitartrate, formic , Yair Margalit, Pacid, oxalic acid, pyruvic acid, butyric acid, iso-butyric acid, hexanoic acid, octanoic acid, a-Ketoglutaric acid, ethanol, methanol, methyl ester, n-propanol, isopropanol, n-butanol, isobutanol, n-amyl alcohol, 3-methylbutanol, 2-methylbutanol, n-hexanol, 2-phenylethanol, polyalcohols (polyols), 2,3-butandiol, glycerol, eythritol, xylitol, arabitol (also called arabinitol), mannitol, acetaldehyde, acetoin and diacetyl, acetate, butyrate, oxanoate and other esters, ethyl acetate, ethyl formate, propyl acetate, isopropyl acetate, isobutyl acetate, isoamyl acetate, phenylethyl acetate, ethyl propionate, ethyl valerate, ethyl hexanoate (caproate), ethyl octanoate (caprylate), ethyl decanoate (caprate), ethyl lactate, ethyl succinate (acidic ester), methyl o-anthranilate, amino acids, diammonium phosphate, proteins, nitrates, amino acid esters, vitamins, biotin, choline, gallic acid, coutaric acid, caftaric acid, fertaric acid, catechin, epicatechin, gallocatechin gallate, procyanidin [(B1, B2, B3)], catechin catechin gallate, hydroxycinnamic acid esters [(coutaric, caftaric, fertaric)], acids, glutathionyl caftaric acid, catechin+epicatechin, catechin-gallate, afzelechin, catechin, epicatechin, and gallocatechin, flavane (3,4) diol, flavonol-3, cyanindin, delphinidin, peonidin, petunidin, mallvidin, anthocyanins, glycosic,

catechin, epicatechin, potassium, sodium, calcium, iron, lithium, magnesium, copper, lead, manganese, aluminum, zinc, rubidium, arsenic, nickel, anions, phosphate, sulfate, borates, silicates, halogens, fatty acids, boron, florine, silicon, phosphate, sulfate, chlorine, bromine, iodine, anions, sulfur dioxide, acetaldehyde-bisulfite (bound SO2), fumaric acid, vinylbenzene, benzaldehyde, γ-nonalactone, ethyl phenylacetate, p-hydroxybenzoic acid, p-pyrocatechuic acid, gallic acid, vanillic acid,syringic acid, salicyclic acid, o-pyrocatechuic acid, gentisic acid, cinnamic acid, cinnamic acid, p-coumaric acid, caffeic acid, ferulic acid, sinaptic acid, coutaric acid, caftaric acid, fertaric acid, digallic acid, ellagic acid, flavonoids, afzelechin, catechin, gallocatechin, glycosides, tannins, flavylium ion, anthocyanins, pelargonidin, cyanidin, delphinidin, peonidin, petunidin, mallvidin, ethyl acetate, ethyl caproate, terpenoids, glycosides, pyrazines, phenolics, chlorogenic acid, methyl anthranilate, ethyl anthranilate, methyl salicylate, ethyl salicylate, 2-methoxymethyl benzoate, 2 methoxyethyl benzoate, ethyl trans-2 -butenoate, ethyl trans-2-hexenoate, ethyl trans-2-octenoate, ethyl trans-2-decenoate, ethyl trans, trans-2,4 decadienoate, ethyl trans, cis-2,4 decadienoate, ethyl trans, trans, cis-2,4,7-decatrienoate, ethyl trans, cis-2,6-dodecadienoate, methyl 3-hydroxybutanoate, dehyl 3-hydroxybutanoate, ethyl 3-hydroxyhexanoate, damascenone, furaneol, methoxyfuraneol, ethyl 3-mercaptopropanoate, trans-2-hexen-1-ol, hydrogen disulfide, carbon disulfide, dimethyl disulfide, dimethyl sulfide, diethyl sulfide, diethyl disulfide, methanethiol, ethanethiol, dimethyl sulfoxide, methyl thiolacetate, ethyl

thiolacetate, cis and trans-2-methylthiophan-3-ol, 5-[hydroxyethyl]-4-methylthiazole, thio aliphatic alcohols, methanionol, or 3-(methylthio)-propanol, polyphenoloxidases, laccase, chlorogenic acid, protocatechuic acid, glutathione,, 2-S-glutathionylcaftaric acid, acetaldehyde, 13C-Norisoprenoids,1,1,6-trimethyl-1,2-dihydronaphthalene (TDN), vitispirane, ellagic acid, lignins, gallic acid, aromatic aldehydes, vanillin, syringaldehyde, coniferyaldehyde, sinapaldehyde, γlactones, cis-β-methyl-γ-lactone, trans-β-methyl-γ-lactone, maltol, cyclotene, ethoxylactone, furfural, furfuryl alcohol, Guaiacol, geosmin, anthocyanine-bisulfite, malvidin glucoside,quinones, tartaric acid, potassium bitartrate, calcium tartrate, furmaric acid, calcium carbonate, sorbic acid, ethyl sorbate, benzoic acid and sodium benzoate, diethyl dicarbonate (DEDC), dimethyl dicarbonate (DMDC), iron, copper, aluminum, hydrogen sulfide, mercaptan, diethyl sulfide, ethyl mercaptan, (1)pH, diacetyl, acetoin, 2,3-butandiol, 2-ethoxyhexa-3.5-diene, histamine, tyramine, putrescine, cadaverine, ethyl carbamate, urea and carbamyl phosphate.

42. (Amended) A wine cork quality sensor, comprising:

means for sensing data indicative of cork quality, wherein said means for sensing data comprises at least one sensor for directly monitoring at least one chemical factor within a cork indicative of cork spoilage; and

means for measuring and quantifying said data.

44. (Amended) The wine cork quality sensor of claim [43] 42, wherein said at least one chemical factor is selected from the group consisting of 2,4,6-Trichloroanisole, o-Hydroxyanisole,1-octen-3-one and 1-octen-3-ol,Trans-1,10-dimethyl-trans-9-decalol, 2-methylisoborneol and TCA (trichloroacetic acid).

45. (Amended) A method for measuring wine cork quality, comprising:

sensing data indicative of cork quality, wherein the step of sensing data is carried out with means for sensing data indicative of cork quality, wherein said means for sensing data comprises at least one sensor for directly monitoring at least one chemical factor within a cork indicative of cork spoilage; and

measuring and quantifying said data.

47. (Amended) The method of claim [46] 45, wherein said at least one chemical factor is selected from the group consisting of 2,4,6-Trichloroanisole, o-Hydroxyanisole,1-octen-3-one and 1-octen-3-ol,Trans-1,10-dimethyl-trans-9-decalol, 2-methylisoborneol and TCA (trichloroacetic acid).